

Remarks

Claim 1 has been amended to require that the fuel composition include a polyether and/or polyetheramine fluidizer, and the polyether and polyetheramine have been further defined. Support for the amendment can be found on lines 26 to 30 of page 9, on lines 6 to 24 of page 7, and on line 25 of page 7 to line 13 of page 8.

Claims 1, 3 and 6-15 are rejected per 35 USC 102(b) for being anticipated by Harle (US 4,166,726).

Harle discloses a fuel composition comprising a hydrocarbon fuel, a polyalkylene amine where the amine can be a polyamine, a product of a Mannich condensation reaction of an alkylphenol and an aldehyde and an amine which can be a polyamine. Harle also discloses that the fuel composition can include a minor amount of a material having demulsifier properties to include polyolpolyethers which are derived from a polyol which has more than one -OH or hydroxyl group.

The fuel composition of currently amended claim 1 of this application comprises a hydrocarbon fuel, a combination of nitrogen-containing detergents comprising a hydrocarbyl-substituted polyamine and a Mannich reaction product, and a fluidizer comprising a polyether, a polyetheramine or a mixture thereof where the weight ratio of the fluidizer to the combination of nitrogen-containing detergents is less than 0.2, and where the polyether and polyetheramine are represented respectively by formulas $RO[CH_2CH(R^1)O]_xH$ and $R[OCH_2CH(R^1)]_nA$ where R is a hydrocarbyl group. The formulas for the polyether and polyetheramine show that the polyether and polyetheramine are derived from a hydrocarbyl-containing compound that has a single -OH or hydroxyl group. Since Harle does not disclose the limitation of claim 1 that the weight ratio of the fluidizer to the nitrogen-containing detergents is less than 0.2 and that the polyether fluidizer is derived from a compound having only a single hydroxyl group, it is respectfully submitted that claim 1 and dependent claims 3 and 6-15, which depend directly or indirectly from claim 1, are not anticipated by Harle.

Claims 1, 3, 6-10 and 13-15 are rejected per 35 USC 103(a) as being unpatentable for obviousness over Cunningham et al. (US 5,679,116) with Udelhofen et al. (US 4,231,759) as an evidentiary reference.

Cunningham et al. disclose a fuel composition that comprises (i) at least one detergent which is (a) a derivative of a hydrocarbon-substituted dicarboxylic acid or anhydride, (b) a hydrocarbon-substituted polyamine and/or (c) a Mannich condensation product and (iii) a carrier fluid where the carrier fluid can be a polyoxyalkylene compound and where the weight ratio of the detergent or detergents to the polyoxyalkylene carrier fluid falls in the range per lines 1-5 of column 15 of about 0.05:1 to 0.5:1. Cunningham also disclose that the Mannich detergent as described in Udelhofen is most preferred. Cunningham disclose in the weight ratio of detergent or detergents to polyoxyalkylene carrier fluid that the carrier fluid is present relative to the detergent or detergents in a major amount. The weight ratio of detergent to polyoxyalkylene carrier fluid of Cunningham can be restated as a weight ratio of polyoxyalkylene carrier fluid to detergent(s) which becomes 1:0.05 to 1:0.5 which can also be expressed as 20 (1 divided by 0.05) to 2 (1 divided by 0.5) and which shows that the carrier fluid is present relative to the detergent(s) at 2 to 20 times the amount of the detergent(s).

The fuel composition of currently amended claim 1 of this application comprises a hydrocarbon fuel, a combination of nitrogen-containing detergents comprising a hydrocarbyl-substituted polyamine and a Mannich reaction product, and a fluidizer comprising a polyether, a polyetheramine or a mixture thereof where the weight ratio of the fluidizer to the combination of nitrogen-containing detergents is less than 0.2 which can also be expressed as 0.2:1. The fluidizer of this application is present relative to the combination of detergents in a minor amount which is less than 0.2 times the amount of the combination of detergents. Since Cunningham or Cunningham in combination with Udelhofen do not disclose or suggest the weight ratio of fluidizer to the combination of detergents of the present invention where the fluidizer is present in a minor amount relative to the detergents, it is respectfully submitted that claim 1 and dependent claims 3, 6-10 and 13-15 are patentable over Cunningham with Udelhofen as an evidentiary reference.

Claims 11 and 12 are rejected per 35 USC 103(a) as being unpatentable for obviousness over Cunningham et al. (US 5,679,116) and further in view of Malfer et al. (US 5,725,612).

Cunningham et al. disclose, as described earlier hereinabove, a fuel composition in which the carrier fluid is present in a major amount relative to the detergent or detergents. Malfer et al. disclose a Mannich reaction product derived from high reactivity polybutylenes having high

proportions of polymer molecules with a terminal vinylidene group where the Mannich reaction product is useful as a detergent in a gasoline fuel composition.

The fuel composition of currently amended claim 1 of the present invention, as described earlier hereinabove, comprises a combination of detergents and a fluidizer in which the fluidizer is present in a minor amount relative to the detergents. Since the combination of Cunningham in view of Malfer as applied does not disclose or suggest the fuel composition of the present invention in which the fluidizer is present in a minor amount relative to the detergents, it is respectfully submitted that dependent claims 11 and 12, which indirectly depend from claim 1, are patentable over the combination of Cunningham in view of Malfer.

Claims 1, 3 and 6-15 are rejected per 35 USC 103(a) as being unpatentable for obviousness over Malfer et al. (US 5,725,612) in view of Aiello et al. (US 5,006,130).

Malfer et al. disclose that a Mannich base, formed from a disubstituted hydroxyaromatic compound and a polyamine having only one primary or secondary amino group, is an extremely effective detergent in a gasoline fuel and that including a polyoxyalkylene compound as a carrier fluid further enhances the effectiveness of the Mannich base. Malfer et al. teach on lines 20-27 of column 8 that the weight ratio of carrier fluid to Mannich base usually falls within the range of about 0.3:1 to about 2:1 and preferably within the range of about 0.6:1 to 1.5:1 and further teaches in examples 1-7 of Table 2 in column 11 a weight ratio of 0.8:1 (32:40 in Example 1) to 1.08:1 (35:32.39 in Example 6). Malfer et al. also teach on lines 28-51 of column 8 that small amounts of other additives to include ancillary detergent/dispersant additives can be included with the Mannich base and carrier fluid in a fuel composition.

Aiello et al. disclose a gasoline composition for reducing intake valve deposits that comprises an olefin polymer substituted polyamine and a poly(oxyalkylene) alcohol carrier where on lines 31 to 41 of column 4 the weight ratio of a typical polyamine to carrier is in the range of about 0.8 to 2.1.

The fuel composition of the present invention in currently amended claim 1 comprises a detergent combination of a major amount of a hydrocarbyl-substituted polyamine and a major amount of a Mannich reaction product in a 0.5:1 to 1:0.5 weight ratio, and a polyether and/or polyetheramine fluidizer where the weight ratio of fluidizer to detergent combination is less than 0.2.

The combination of Malfer in view of Aiello does not disclose or suggest combining a major amount of a Mannich base of Malfer and a major amount of a polyamine of Aiello because Malfer teaches on lines 28-51 of column 8 of adding small amount of ancillary detergent/dispersant additives to the Mannich base and carrier fluid. A person of ordinary skill in the art following the teachings and suggestions in Malfer and Aiello would not add a major amount of the polyamine of Aiello to the Mannich base and carrier fluid of Malfer. Based on the above remarks it is respectfully submitted that claim 1 and all the outstanding dependent claims are patentable over Malfer in view of Aiello because the combined references do not disclose or suggest the 0.5:1 to 1:0.5 weight ratio for the Mannich reaction product and hydrocarbyl-substituted polyamine of the present invention.

The combination of Malfer in view of Aiello does not disclose or suggest that the weight ratio of the present invention of fluidizer to combination of detergents is less than 0.2. Malfer et al., as described above, disclose that the weight ratio of carrier fluid to Mannich base usually falls within about 0.3:1 to about 2:1 and preferably within about 0.6:1 to about 1.5:1 and in examples teach weight ratios falling in the preferred range. The lowest weight ratio of Malfer is about 0.3:1 which can be below 0.3 but is above 0.2. A person of ordinary skill in the art following Malfer et al. regarding the weight ratio of carrier fluid to Mannich base would try or select a weight ratio of about 0.3:1 and preferably higher to obtain good performance since this would be obvious from the disclosure and suggestions of Malfer et al. Since Malfer et al. disclose or suggest weight ratios falling within about 0.3:1 to about 2:1 and preferably within about 0.6:1 to about 1.5:1, Malfer et al. do not disclose or suggest a weight ratio of less than 0.2. Aiello et al., as described above, disclose a weight ratio for a typical polyamine and carrier in a range of 0.8 to 2.1 which becomes a range for a weight ratio of carrier to polyamine of 1:0.8 to 1:2.1 which can be expressed as 1.25 (1 divided by 0.8) to 0.48 (1 divided by 2.1). Aiello et al. also further disclose in the examples of tables 1-6 weight ratios of carrier to polyamine that fall in the 0.48 to 1.25 range. Since Aiello et al. disclose or suggest weight ratios of carrier to polyamine falling between 0.48 to 1.25, Aiello et al. do not disclose or suggest a weight ratio of less than 0.2. Since Malfer and Aiello separately do not disclose or suggest a weight ratio of less than 0.2, Malfer and Aiello in combination do not disclose or suggest a weight ratio of less than 0.2. Applicants respectfully submit that claims 1, 3 and 6-15 are patentable over Malfer in view

• of Aiello because the combined references do not disclose or suggest a weight ratio of less than 0.2 for the fluidizer and combination of Mannich and hydrocarbyl polyamine detergents of the present invention.

• From the foregoing amendments and remarks, it is submitted that the present claims are in condition for allowance and that the reply to this Office Action is fully responsive. An early and favorable reconsideration is respectfully requested. If the Examiner believes that only minor issues remain to be resolved, a telephone call to the undersigned is suggested.

• Any deficiency or overpayment in fees for this application should be charged or credited to Deposit Account No. 12-2275 (The Lubrizol Corporation).

Respectfully submitted,
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